

PTO/SB/21 (09-04)

Approved for use through 07/31/2006. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

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**TRANSMITTAL
FORM**

(to be used for all correspondence after initial filing)

Total Number of Pages in This Submission

Application Number

10/642,248

Filing Date

08/15/2003

First Named Inventor

Paul L. DeAngelis

Art Unit

1656

Examiner Name

Nashaat T. Nashed

Attorney Docket Number

35542.097

ENCLOSURES (Check all that apply)

Fee Transmittal Form



Fee Attached



Amendment/Reply



After Final



Affidavits/declaration(s)



Extension of Time Request



Express Abandonment Request



Information Disclosure Statement



Certified Copy of Priority Document(s)

Reply to Missing Parts/
Incomplete ApplicationReply to Missing Parts
under 37 CFR 1.52 or 1.53

Drawing(s)



Licensing-related Papers



Petition

Petition to Convert to a
Provisional ApplicationPower of Attorney, Revocation of POA,
Change of Correspondence Address

Terminal Disclaimer



Request for Refund



CD, Number of CD(s) _____

☐ Landscape Table on CD

After Allowance Communication to TC

Appeal Communication to Board
of Appeals and InterferencesAppeal Communication to TC
(Appeal Notice, Brief, Reply Brief)

Proprietary Information



Status Letter

Other Enclosure(s) (please identify
below):

Certificate of Correction

Remarks

1. Credit Card Payment Form (1 page);
2. Fee Transmittal (1 page);
3. Transmittal (1 page);
4. Request For Certificate of Correction of Patent (6 pages);
5. Certificate of Correction (35 pages); and
6. Postcard.

SIGNATURE OF APPLICANT, ATTORNEY, OR AGENT

Firm Name

DUNLAP, CODDING & ROGERS, P.C.

Signature

Printed name

Kathryn L. Hester

Date

August 2, 2007

Reg. No.

46,768

CERTIFICATE OF TRANSMISSION/MAILING

I hereby certify that this correspondence is being facsimile transmitted to the USPTO or deposited with the United States Postal Service with sufficient postage as first class mail in an envelope addressed to: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450 on the date shown below: *** SENT BY EXPRESS MAILNO. EV 887844146 US, DATED 08/02/2007 ***

Signature

Typed or printed name

Kathryn L. Hester

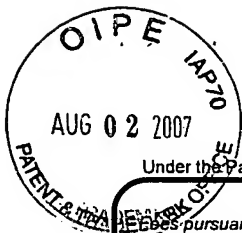
Date

August 2, 2007

This collection of information is required by 37 CFR 1.5. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to 2 hours to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

AUG 7 2007



PTO/SB/17 (12-04v2)

Approved for use through 07/31/2006. OMB 0651-0032

U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

Under the Paperwork Reduction Act of 1995 no persons are required to respond to a collection of information unless it displays a valid OMB control number

Effective on 12/08/2004.

Fees pursuant to the Consolidated Appropriations Act, 2005 (H.R. 4818).

FEE TRANSMITTAL

For FY 2007

☐ Applicant claims small entity status. See 37 CFR 1.27

TOTAL AMOUNT OF PAYMENT (\$) 100.00

Complete if Known

Application Number	10/642,248
Filing Date	08/15/2003
First Named Inventor	Paul L. DeAngelis
Examiner Name	Nashaat T. Nashed
Art Unit	1656
Attorney Docket No.	35542.097

METHOD OF PAYMENT (check all that apply)

☐ Check ☒ Credit Card ☐ Money Order ☐ None ☐ Other (please identify): _____☐ Deposit Account Deposit Account Number: _____ Deposit Account Name: _____

For the above-identified deposit account, the Director is hereby authorized to: (check all that apply)

☐ Charge fee(s) indicated below ☐ Charge fee(s) indicated below, except for the filing fee☐ Charge any additional fee(s) or underpayments of fee(s) under 37 CFR 1.16 and 1.17 ☐ Credit any overpayments

WARNING: Information on this form may become public. Credit card information should not be included on this form. Provide credit card information and authorization on PTO-2038.

FEE CALCULATION

1. BASIC FILING, SEARCH, AND EXAMINATION FEES

Application Type	FILING FEES		SEARCH FEES		EXAMINATION FEES		Fees Paid (\$)
	Fee (\$)	Small Entity Fee (\$)	Fee (\$)	Small Entity Fee (\$)	Fee (\$)	Small Entity Fee (\$)	
Utility	300	150	500	250	200	100	
Design	200	100	100	50	130	65	
Plant	200	100	300	150	160	80	
Reissue	300	150	500	250	600	300	
Provisional	200	100	0	0	0	0	

2. EXCESS CLAIM FEES

Fee Description

	Fee (\$)	Small Entity Fee (\$)
Each claim over 20 (including Reissues)	50	25
Each independent claim over 3 (including Reissues)	200	100
Multiple dependent claims	360	180

Total Claims	Extra Claims	Fee (\$)	Fee Paid (\$)
- 20 or HP = 0	x	=	0

HP = highest number of total claims paid for, if greater than 20.

Indep. Claims	Extra Claims	Fee (\$)	Fee Paid (\$)
- 3 or HP = 0	x	=	0

HP = highest number of independent claims paid for, if greater than 3.

3. APPLICATION SIZE FEE

If the specification and drawings exceed 100 sheets of paper (excluding electronically filed sequence or computer listings under 37 CFR 1.52(e)), the application size fee due is \$250 (\$125 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).

Total Sheets	Extra Sheets	Number of each additional 50 or fraction thereof	Fee (\$)	Fee Paid (\$)
- 100 = 0	/ 50 = 1	(round up to a whole number) x	=	0

4. OTHER FEE(S)

Non-English Specification, \$130 fee (no small entity discount)

Other (e.g., late filing surcharge): Certificate of Correction Code - 1811

Fees Paid (\$)

100.00

SUBMITTED BY

Signature		Registration No. (Attorney/Agent)	46,768	Telephone	405-607-8600
Name (Print/Type)	Kathryn L. Hester			Date	August 2, 2007

This collection of information is required by 37 CFR 1.138. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 30 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

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08-03-07

Cofc

Express Mail: EV 887844146US

PATENT

Date Deposited: August 2, 2007



IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Patent No.: 7,223,571 B2

Serial No.: 10/642,248

Issued: 05/29/2007

Inventor: Paul DeAngelis and Wei Jing

Atty. Docket No.: 35542.097

Customer No.: 30589

Attn: Certificate of Correction Branch

Commissioner for Patents

P.O. Box 1450

Alexandria, VA 22313-1450

**REQUEST FOR CERTIFICATE OF CORRECTION OF PATENT
FOR PTO AND/OR APPLICANT'S MISTAKES (37 CFR 1.322(a) and 1.323)**

Enclosed are:

- ☒ [X] PTO-2038 Credit Card Form;
- ☒ [X] sb17 Fee Transmittal Form;
- ☒ [X] sb21 Transmittal Form;
- ☒ [X] 35 sheet(s) of form sb44 Certificate of Correction; and
- ☒ [X] pre-addressed Postal Card

**Certificate
AUG 07 2007
of Correction**

[X] PTO ERRORS

The exact column and line number where the mistakes occur in the patent as well as reference to the exact page and line number where the correct information occurs in the application file:

Page 4 of "References", Column 2, line 37: After line 37, insert the reference

-- "Construction and Characterization of a Potential Live Oral Carrier-Based Vaccine Against *Vibrio Cholerae*." Favre et al. Infection and Immunity. September 1996. Vol. 64, No. 9 pages 3565-3570, entire document. --

AUG 7 2007

(See Response to Office Action, dated 03/03/2006, pg. 8 of 13 of IDS, line EA)

In the Specification:

Column 2, line 25: Before the word "polysaccharide's" delete " * ".

(See Application filed 08/15/2003, pg. 3, line 2, ¶ 12)

Column 4, line 14: Delete "syntheses" and replace with -- synthases --.

(See Application filed 08/15/2003, pg. 5, line 2, ¶ 20)

Column 13, line 55: Delete " µof " and replace with -- µg of -- .

(See Application filed 08/15/2003, pg. 17, line 2, ¶ 67)

Column 21, line 39: Delete "AX@" and replace with -- "X" -- .

(See Application filed 08/15/2003, pg. 27, line 27, ¶ 106)

Column 34, line 10: Delete "(5 lane)" and replace with -- (S lane) -- .

(See Application filed 08/15/2003, pg. 43, line 20, ¶ 154)

Column 34, line 47: Delete "pmHAS¹⁻⁷⁰³ " and replace with -- pmHAS¹⁻⁷⁰³ -- .

(See Application filed 08/15/2003, pg. 44, line 9, ¶ 156)

Column 36, lines 33-34: Delete " pmHAS¹⁻⁷⁰³ " and replace with -- pmHAS¹⁻⁷⁰³ -- .

(See Application filed 08/15/2003, pg. 46, line 3 of ¶ 165)

Column 40, line 15: Delete "pmHAS¹⁻⁷⁰³ " and replace with -- pmHAS¹⁻⁷⁰³ -- .

(See Application filed 08/15/2003, pg. 51, line 26, ¶ 176)

Column 42, line 31: Delete "ANXN@" and replace with -- "NXN" -- .

(See Application filed 08/15/2003, pg. 54, line 29, ¶ 183)

Column 43, line 21: After " coli " insert a -- . --

(See Application filed 08/15/2003, pg. 55, line 3 of ¶ 186)

Column 46, line 49: Delete " "swapping@" and replace with -- "swapping" -- .

(See Application filed 08/15/2003, pg. 60, line 5, ¶ 195)

Column 49, line 56: Delete "pmHS¹ " and replace with -- pmHS¹ -- .

(See Application filed 08/15/2003, pg. 63, line 35, ¶ 207)

Column 54, line 67: Delete "r Hybrid r" and replace with -- or Hybrid or --

(See Application filed 08/15/2003, pg. 72, line 3, ¶ 222)

Column 57, line 21: Delete "D Main" and replace with -- Domain -- .

(See Application filed 08/15/2003, pg. 75, line 3, ¶ 230)

AUG 7 2007

Column 57, line 30: After words "library clone" delete "contain" and replace with -- containing -- .

(See Application filed 08/15/2003, pg. 75, line 9, ¶ 230)

Column 57, line 54: Delete "pMCS" and replace with -- pmCS -- .

(See Application filed 08/15/2003, pg. 75, line 23, ¶ 231)

Column 70, lines 41-42: Delete "orchimeric" and replace with -- or chimeric -- .

(See Application filed 08/15/2003, pg. 91, line 31, ¶ 294)

Column 70, line 60: Delete " *xenopus* " and replace with -- *Xenopus* -- .

(See Application filed 08/15/2003, pg. 92, line 7, ¶ 295)

In the Claims:

Column 221, line 53: Delete "glycosamirioglycan" and replace

with -- glycosaminoglycan -- .

(See Amendment & Statement of Substance of Interview with Examiner, 09/21/2006, pg. 6, claim 26)

In the Sequence listing:

Column 81, at the bottom of the page: Delete "<160> NUMBER OF SEQ ID NOS: 71"

and replace with -- <160> NUMBER OF SEQ ID NOS: 85 --

(See "Second Submission of Sequence Listing and Statement ...", filed 02/06/2007)

Columns 219 - 220: After the Sequence listing and before the claims, insert portion of the Sequence Listing containing SEQ ID NOS: 72 - 85

(See "Second Submission of Sequence Listing and Statement", filed 02/06/2007)

For the sake of brevity, the portion of the Sequence Listing for SEQ ID NOS: 72-85 has not been reproduced in this request; however, the portion of the Sequence Listing containing SEQ ID NOS: 72-85 appears in its entirety in the attached Form PTO/SB/44.

[X] No fee is submitted herewith.

[X] APPLICANT'S ERRORS

It is noted that errors appear in this patent of a clerical or typographical nature or a minor character as more fully described below. These errors occurred in good faith, and correction thereof does not involve such changes in the patent as would constitute new matter or would require re-examination. Thus, a Certificate of Correction is requested.

The exact column and line number where the mistakes occur in the patent are:

In the Specification:

- Column 6, line 40: Delete "PmHS2" and replace with -- pmHS2 -- .
- Column 6, line 45: Delete "PmHS2" and replace with -- pmHS2 -- .
- Column 7, line 1 : Delete "a short chondroitin polymer," .
- Column 7, line 14: Delete "pnHS, and PmHS2" and replace with
-- pmHS1, and pmHS2 --
- Column 7, line 18: Delete "PmHS2" and replace with -- pmHS2 -- .
- Column 7, line 63: After the word "growth" delete ":" and replace with -- ; -- .
- Column 8, line 15: Delete "PmHS2" and replace with -- pmHS2 -- .
- Column 8, line 20: Delete "PmHS2" and replace with -- pmHS2 -- .
- Column 8, line 26: Delete "PmHS2" and replace with -- pmHS2 -- .
- Column 8, line 34: Delete "PmHS2" and replace with -- pmHS2 -- .
- Column 9, line 27: Delete "PmHS2" and replace with -- pmHS2 -- .
- Column 9, line 31: Delete "therpaeutic" and replace with -- therapeutic -- .
- Column 12, line 53: Delete "PmHS2" and replace with -- pmHS2 -- .
- Column 13, line 4: Delete "Gal-NAc" and replace with -- GalNAc -- .
- Column 15, line 1: Delete "eithera" and replace with -- either a -- .
- Column 19, line 4: Delete "PmHS2" and replace with -- pmHS2 -- .
- Column 19, line 23: Delete "PmHS2" and replace with -- pmHS2 -- .
- Column 19, line 27: Delete "PmHS2" and replace with -- pmHS2 -- .
- Column 19, line 41: Delete "PmHS2" and replace with -- pmHS2 -- .
- Column 20, line 7: Delete "PmHS2" and replace with -- pmHS2 -- .
- Column 20, line 17: Delete "PmHS2" and replace with -- pmHS2 -- .
- Column 20, line 44: Delete "PmHS2" and replace with -- pmHS2 -- .
- Column 20, line 63: Delete "PmHS2" and replace with -- pmHS2 -- .
- Column 22, line 23: Delete "PmHS2" and replace with -- pmHS2 -- .
- Column 22, line 26: Delete "PmHS2" and replace with -- pmHS2 -- .
- Column 25, line 66: Delete "solution 1% SDS" and replace with
-- solution/1.0% SDS, followed with --
- Column 26, line 26: Delete " 5'-CGCTAT-3' " and replace with -- 5'-CGCTAT-3' --
- Column 26, line 28: Delete "base-pair" and replace with -- base pair --
- Column 27, line 39: Delete "PmHS2" and replace with -- pmHS2 -- .
- Column 28, line 36: Delete "PmCS" and replace with -- pmCS -- .
- Column 28, line 40: Delete "PmCS" and replace with -- pmCS -- .
- Column 30, line 54: Delete "GlcUa" and replace with -- GlcUA -- .
- Column 30, line 64: Delete "PmCS" and replace with -- pmCS -- .
- Column 30, line 65: Delete "PmHS2" and replace with -- pmHS2 -- .

Column 31, line 67: Delete "4.4." and replace with -- 4.4 -- .
 Column 37, line 65-66: Delete "ethleneg-lycol" and replace with -- ethlene glycol -- .
 Column 38, line 22: Delete "PmHS2" and replace with -- pmHS2 -- .
 Column 38, line 40-41: After "(Dig Easy Hyb)" delete "at 37° C. overnight" .
 Column 38, line 51: After "In order" delete " , " .
 Column 40, line 8: Delete "were mutated".
 Column 42, lines 34-36: Delete "UDP-GalNAc in analogy to pmHAS transferring [3H]GalNAc to HA oligosaccharides using UDP-GlcNAc" and replace with
 -- UDP-[3H]GalNAc in analogy to pmHAS transferring [3H]GlcNAc to HA oligosaccharides using UDP-[3H]GlcNAc --

 Column 46, line 32: Delete "pCS" and replace with -- pmCS -- .
 Column 49, line 5: Delete "PmHS2" and replace with -- pmHS2 -- .
 Column 49, line 13: Delete "PmHS2" and replace with -- pmHS2 -- .
 Column 49, line 19: Delete "PmHS2" and replace with -- pmHS2 -- .
 Column 49, line 35: Delete "PmHS2" and replace with -- pmHS2 -- .
 Column 49, line 55: After "GenBank" delete the superscript " ¹⁵ " .
 Column 50, line 2: After "Tuner" insert a -- , --
 Column 50, line 28: Delete "PmHS2" and replace with -- pmHS2 -- .
 Column 50, line 31: Delete "PmHS2" and replace with -- pmHS2 -- .
 Column 50, line 33: Delete "PmHS2" and replace with -- pmHS2 -- .
 Column 50, line 37: Delete "PmHS2" and replace with -- pmHS2 -- .
 Column 51, line 37: Delete "PmHS2" and replace with -- pmHS2 -- .
 Column 51, line 42: Delete "PmHS2" and replace with -- pmHS2 -- .
 Column 51, line 58: Delete "PmHS2" and replace with -- pmHS2 -- .
 Column 51, line 61: Delete "PmHS2" and replace with -- pmHS2 -- .
 Column 52, line 1: Delete "PmHS2" and replace with -- pmHS2 -- .
 Column 52, line 55: Delete "PmHS2" and replace with -- pmHS2 -- .
 Column 54, line 3: Delete "PmHS2" and replace with -- pmHS2 -- .
 Column 54, line 66: Delete "PmHS2" and replace with -- pmHS2 -- .
 Column 55, line 14: Delete "PmHS2" and replace with -- pmHS2 -- .
 Column 55, line 18: Delete "PmHS2" and replace with -- pmHS2 -- .
 Column 55, line 29: Delete "PmHS2" and replace with -- pmHS2 -- .
 Column 55, line 39: Delete "Haase" and replace with -- HAase -- .
 Column 55, line 40: Delete "Hep2 or Hep2" and replace with -- Hep2 or Hep3 -- .
 Column 55, line 43: Delete " *E. Coli* " and replace with -- *E. coli* -- .
 Column 57, line 55: Delete "Table XXII" and replace with -- (Table XXII) -- .
 Column 60, line 10: Delete "3H, 125I" and replace with -- ³H, ¹²⁵I -- .
 Column 62, line 65: After the word "In" and before "FIG." delete "the" .
 Column 63, line 53: Delete "(BDDS)" and replace with -- (BDDS) -- .
 Column 67, lines 5-6: Delete "Atailored@" and replace with -- "tailored" -- .
 Column 67, line 15: Delete "PmHS2" and replace with -- pmHS2 -- .
 Column 67, line 18: Delete "PmHS2" and replace with -- pmHS2 -- .
 Column 68, line 16: Delete "PmHS2" and replace with -- pmHS2 -- .
 Column 72, line 47: Delete " "Zap Express" " and replace with -- ZAPEXPRESS® -- .
 Column 72, line 60: Delete "the-insert" and replace with -- the insert -- .

Column 75, line 60: Delete "pmHAS1-703 or pmCS1-704" and replace with
-- pmHAS¹⁻⁷⁰³ or pmCS¹⁻⁷⁰⁴ -- .

Column 76, line 22: Delete " '30 cm;" and replace with -- x 30 cm; -- .

Column 76, line 29: Delete "dn/dC" and replace with -- dn/dc -- .

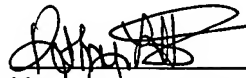
In the Claims:

Column 221, line 38: Delete "combinationS" and replace with -- combinations -- .

☒ [X] Payment by credit card. Form PTO-2038 is attached..

[X] RETURN OF CERTIFICATE

Please send the Certificate of Correction to the undersigned.



Kathryn L. Hester, Reg. No. 46,768
DUNLAP CODDING & ROGERS, P.C.
P.O. Box 16370
Oklahoma City, Oklahoma 73113
Telephone: 405/607-8600
Facsimile: 405/607-8686

Agent for Applicant

AUG 7 2007

UNITED STATES PATENT AND TRADEMARK OFFICE
CERTIFICATE OF CORRECTION

Page 1 of 35

PATENT NO. : 7,223,571 B2
APPLICATION NO.: 10/642,248
ISSUE DATE : May 29, 2007
INVENTOR(S) : Paul DeAngelis and Wei Jing

It is certified that an error appears or errors appear in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

Page 4 of "References", Column 2, line 37: After line 37, insert
the reference -- "Construction and Characterization of a Potential Live
Oral Carrier-Based Vaccine Against *Vibrio Cholerae*." Favre et al.
Infection and Immunity. September 1996. Vol. 64, No. 9 pages 3565-3570,
entire document. --

In the Specification:

Column 2, line 25: Before the word "polysaccharide's" delete " * ".

Column 4, line 14: Delete "syntheses" and replace with -- synthases --.

Column 6, line 40: Delete "PmHS2" and replace with -- pmHS2 -- .

Column 6, line 45: Delete "PmHS2" and replace with -- pmHS2 -- .

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Column 7, line 18: Delete "PmHS2" and replace with -- pmHS2 -- .

Column 7, line 63: After the word "growth" delete ":" and replace with -- ; -- .

Column 8, line 15: Delete "PmHS2" and replace with -- pmHS2 -- .

Column 8, line 20: Delete "PmHS2" and replace with -- pmHS2 -- .

Column 8, line 26: Delete "PmHS2" and replace with -- pmHS2 -- .

Column 8, line 34: Delete "PmHS2" and replace with -- pmHS2 -- .

MAILING ADDRESS OF SENDER (Please do not use customer number below):

Kathryn L. Hester, Reg. # 46,768
Dunlap Coddling & Rogers, P.C.
P. O. Box 16370
Oklahoma City, OK 73113

This collection of information is required by 37 CFR 1.322, 1.323, and 1.324. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 1.0 hour to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Attention Certificate of Corrections Branch, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

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UNITED STATES PATENT AND TRADEMARK OFFICE
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Page 2 of 35

PATENT NO. : 7,223,571 B2
APPLICATION NO.: 10/642,248
ISSUE DATE : May 29, 2007
INVENTOR(S) : Paul DeAngelis and Wei Jing

It is certified that an error appears or errors appear in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

Column 9, line 27: Delete "PmHS2" and replace with -- pmHS2 -- .
Column 9, line 31: Delete "therpaeutic" and replace with -- therapeutic -- .
Column 12, line 53: Delete "PmHS2" and replace with -- pmHS2 -- .
Column 13, line 4: Delete "Gal-NAc" and replace with -- GalNAc -- .
Column 13, line 55: Delete " µof " and replace with -- µg of -- .
Column 15, line 1: Delete "either a" and replace with -- either a -- .
Column 19, line 4: Delete "PmHS2" and replace with -- pmHS2 -- .
Column 19, line 23: Delete "PmHS2" and replace with -- pmHS2 -- .
Column 19, line 27: Delete "PmHS2" and replace with -- pmHS2 -- .
Column 19, line 41: Delete "PmHS2" and replace with -- pmHS2 -- .
Column 20, line 7: Delete "PmHS2" and replace with -- pmHS2 -- .
Column 20, line 17: Delete "PmHS2" and replace with -- pmHS2 -- .
Column 20, line 44: Delete "PmHS2" and replace with -- pmHS2 -- .
Column 20, line 63: Delete "PmHS2" and replace with -- pmHS2 -- .
Column 21, line 39: Delete "AX@" and replace with -- "X" -- .
Column 22, line 23: Delete "PmHS2" and replace with -- pmHS2 -- .
Column 22, line 26: Delete "PmHS2" and replace with -- pmHS2 -- .
Column 25, line 66: Delete "solution 1% SDS" and replace with
-- solution/1.0% SDS, followed with --

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Dunlap Coddling & Rogers, P.C.
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Oklahoma City, OK 73113

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Page 3 of 35

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INVENTOR(S) : Paul DeAngelis and Wei Jing

It is certified that an error appears or errors appear in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

Column 26, line 26: Delete " 5'-CGCTAT-3' " and replace with -- 5'-CGCTAT-3' --
Column 26, line 28: Delete "base-pair" and replace with -- base pair --
Column 27, line 39: Delete "PmHS2" and replace with -- pmHS2 -- .
Column 28, line 36: Delete "PmCS" and replace with -- pmCS -- .
Column 28, line 40: Delete "PmCS" and replace with -- pmCS -- .
Column 30, line 54: Delete "GlcUa" and replace with -- GlcUA -- .
Column 30, line 64: Delete "PmCS" and replace with -- pmCS -- .
Column 30, line 65: Delete "PmHS2" and replace with -- pmHS2 -- .
Column 31, line 67: Delete "4.4." and replace with -- 4.4 -- .
Column 34, line 10: Delete "(5 lane)" and replace with -- (S lane) -- .
Column 34, line 47: Delete "pmHAS¹⁻⁷⁰³ " and replace with -- pmHAS¹⁻⁷⁰³ -- .
Column 36, lines 33-34: Delete " pmHAS¹⁻⁷⁰³ " and replace with -- pmHAS¹⁻⁷⁰³ -- .
Column 37, line 65-66: Delete "ethleneg-lycol" and replace with -- ethlene glycol -- .
Column 38, line 22: Delete "PmHS2" and replace with -- pmHS2 -- .
Column 38, line 40-41: After "(Dig Easy Hyb)" delete "at 37 C. overnight" .
Column 38, line 51: After "In order" delete " , " .
Column 40, line 8: Delete "were mutated".
Column 40, line 15: [Delete "pmHAS¹⁻⁷⁰³ " and replace with -- pmHAS¹⁻⁷⁰³ -- .
Column 42, line 31: Delete "ANXN@" and replace with -- "NXN" -- .

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Kathryn L. Hester, Reg. # 46,768
Dunlap Coddling & Rogers, P.C.
P. O. Box 16370
Oklahoma City, OK 73113

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UNITED STATES PATENT AND TRADEMARK OFFICE CERTIFICATE OF CORRECTION

Page 4 of 35

PATENT NO. : 7,223,571 B2
APPLICATION NO.: 10/642,248
ISSUE DATE : May 29, 2007
INVENTOR(S) : Paul DeAngelis and Wei Jing

It is certified that an error appears or errors appear in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

Column 42, lines 34-36: Delete "UDP-GalNAc in analogy to pmHAS transferring [3H]GalNAc to HA oligosaccharides using UDP-GlcNAc" and replace with —

Column 43, line 21: After " *coli* " insert a — . —

Column 46, line 32: Delete "pCS" and replace with — pmCS — .

Column 46, line 49: Delete " "swapping@" and replace with — "swapping" — .

Column 49, line 5: Delete "PmHS2" and replace with — pmHS2 — .

Column 49, line 13: Delete "PmHS2" and replace with — pmHS2 — .

Column 49, line 19: Delete "PmHS2" and replace with — pmHS2 — .

Column 49, line 35: Delete "PmHS2" and replace with — pmHS2 — .

Column 49, line 55: After "GenBank" delete the superscript " ¹⁵ " .

Column 49, line 56: Delete "pmHS " and replace with — pmHS1 — .

Column 50, line 2: After "Tuner" insert a — , —

Column 50, line 28: Delete "PmHS2" and replace with — pmHS2 — .

Column 50, line 31: Delete "PmHS2" and replace with — pmHS2 — .

Column 50, line 33: Delete "PmHS2" and replace with — pmHS2 — .

Column 50, line 37: Delete "PmHS2" and replace with — pmHS2 — .

Column 51, line 37: Delete "PmHS2" and replace with — pmHS2 — .

Column 51, line 42: Delete "PmHS2" and replace with — pmHS2 — .

Column 51, line 58: Delete "PmHS2" and replace with — pmHS2 — .

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UNITED STATES PATENT AND TRADEMARK OFFICE
CERTIFICATE OF CORRECTION

Page 5 of 35

PATENT NO. : 7,223,571 B2
APPLICATION NO.: 10/642,248
ISSUE DATE : May 29, 2007
INVENTOR(S) : Paul DeAngelis and Wei Jing

It is certified that an error appears or errors appear in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

Column 51, line 61: Delete "PmHS2" and replace with -- pmHS2 -- .
Column 52, line 1: Delete "PmHS2" and replace with -- pmHS2 -- .
Column 52, line 55: Delete "PmHS2" and replace with -- pmHS2 -- .
Column 54, line 3: Delete "PmHS2" and replace with -- pmHS2 -- .
Column 54, line 66: Delete "PmHS2" and replace with -- pmHS2 -- .
Column 54, line 67: Delete "r Hybrid r" and replace with -- or Hybrid or --
Column 55, line 14: Delete "PmHS2" and replace with -- pmHS2 -- .
Column 55, line 18: Delete "PmHS2" and replace with -- pmHS2 -- .
Column 55, line 29: Delete "PmHS2" and replace with -- pmHS2 -- .
Column 55, line 39: Delete "Haase" and replace with -- HAase -- .
Column 55, line 40: Delete "Hep2 or Hep2" and replace with -- Hep2 or Hep3 -- .
Column 55, line 43: Delete "E. Coli " and replace with -- E. coli -- .
Column 57, line 21: Delete "D Main" and replace with -- Domain -- .
Column 57, line 30: After words "library clone" delete "contain" and replace
with -- containing -- .
Column 57, line 54: Delete "pMCS" and replace with -- pmCS -- .
Column 57, line 55: Delete "Table XXII" and replace with -- (Table XXII) -- .
Column 60, line 10: Delete "3H, 125I" and replace with -- ³H, ¹²⁵I -- .
Column 62, line 65: After the word "In" and before "FIG." delete "the" .
Column 63, line 53: Delete "(BDDS)" and replace with -- (BDDS) -- .
Column 67, lines 5-6: Delete "Atailored@" and replace with -- "tailored" -- .

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UNITED STATES PATENT AND TRADEMARK OFFICE
CERTIFICATE OF CORRECTION

Page 6 of 35

PATENT NO. : 7,223,571 B2

APPLICATION NO.: 10/642,248

ISSUE DATE : May 29, 2007

INVENTOR(S) : Paul DeAngelis and Wei Jing

It is certified that an error appears or errors appear in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

Column 67, line 15: Delete "PmHS2" and replace with -- pmHS2 -- .
Column 67, line 18: Delete "PmHS2" and replace with -- pmHS2 -- .
Column 68, line 16: Delete "PmHS2" and replace with -- pmHS2 -- .
Column 70, lines 41-42: Delete "orchimeric" and replace with -- or chimeric -- .
Column 70, line 60: Delete " *xenopus* " and replace with -- *Xenopus* -- .
Column 72, line 47: Delete ""Zap Express"" and replace with -- ZAPEXPRESS® -- .
Column 72, line 60: Delete "the-insert" and replace with -- the insert -- .
Column 75, line 60: Delete "pmHAS1-703 or pmCS1-704" and replace with
-- pmHAS¹⁻⁷⁰³ or pmCS¹⁻⁷⁰⁴ -- .
Column 76, line 22: Delete " '30 cm;" and replace with -- x 30 cm; -- .
Column 76, line 29: Delete "dn/dc" and replace with -- dn/dc -- .

In the Claims:

Column 221, line 38: Delete "combinationS" and replace with -- combinations -- .
Column 221, line 53: Delete "glycosamirioglycan" and replace with -- glycosaminoglycan -- .

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UNITED STATES PATENT AND TRADEMARK OFFICE CERTIFICATE OF CORRECTION

Page 7 of 35

PATENT NO. : 7,223,571 B2
APPLICATION NO.: 10/642,248
ISSUE DATE : May 29, 2007
INVENTOR(S) : Paul DeAngelis and Wei Jing

It is certified that an error appears or errors appear in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

In the Sequence listing:

Column 81, at the bottom of the page: Delete "<160> NUMBER OF SEQ ID NOS: 71"
and replace with — <160> NUMBER OF SEQ ID NOS: 85 —

Columns 219 - 220: After the Sequence listing and before the claims, insert the following
sequence listing for SEQ ID NOS: 72 - 85:

```
<210> 72
<211> 107
<212> PRT
<213> Pasteurella multocida
<400> 72
Ser Ile Ile Val Thr Thr Phe Asn Arg Pro Ala Ile Leu Ser Ile Thr
1                               10                      15
Leu Ala Cys Leu Val Asn Gln Lys Thr His Tyr Pro Phe Glu Val Ile
20                               25                      30
Val Thr Asp Asp Gly Ser Gln Glu Asp Leu Ser Pro Ile Ile Arg Gln
35                               40                      45
Tyr Glu Asn Lys Leu Asp Ile Arg Tyr Val Arg Gln Lys Asp Asn Gly
50                               55                      60
Phe Gln Ala Ser Ala Ala Arg Asn Met Gly Leu Arg Leu Ala Lys Tyr
65                               70                      75                      80
```

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Page 8 of 35

PATENT NO. : 7,223,571 B2

APPLICATION NO.: 10/642,248

ISSUE DATE : May 29, 2007

INVENTOR(S) : Paul DeAngelis and Wei Jing

It is certified that an error appears or errors appear in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

Asp Phe Ile Gly Leu Leu Asp Cys Asp Met Ala Pro Asn Pro Leu Trp
85 90 95

Val His Ser Tyr Val Ala Glu Leu Leu Glu Asp
100 105

<210> 73
<211> 105
<212> PRT
<213> Pasteurella multocida
<400> 73

Ser Ile Tyr Ile Pro Ala Tyr Asn Cys Ala Asn Tyr Ile Gln Arg Cys
1 5 10 15

Val Asp Ser Ala Leu Asn Gln Thr Thr Val Asp Leu Glu Val Cys Ile
20 25 30

Cys Asn Asp Gly Ser Thr Asp Asn Thr Leu Glu Val Ile Asn Lys Leu
35 40 45

Tyr Gly Asn Asn Pro Arg Val Arg Ile Met Ser Lys Pro Asn Gly Gly
50 55 60

Ile Ala Ser Ala Ser Asn Ala Ala Val Ser Phe Ala Lys Gly Tyr Tyr
65 70 75 80

Ile Gly Gln Leu Asp Ser Asp Asp Tyr Leu Glu Pro Asp Ala Val Glu
85 90 95

Leu Cys Leu Lys Glu Phe Leu Lys Asp
100 105

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UNITED STATES PATENT AND TRADEMARK OFFICE
CERTIFICATE OF CORRECTION

Page 9 of 35

PATENT NO. : 7,223,571 B2

APPLICATION NO.: 10/642,248

ISSUE DATE : May 29, 2007

INVENTOR(S) : Paul DeAngelis and Wei Jing

It is certified that an error appears or errors appear in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

<210> 74
<211> 771
<212> PRT
<213> Pasteurella multocida

<400> 74

Met Asn Thr Leu Ser Gln Ala Ile Lys Ala Tyr Asn Ser Asn Asp Tyr
1 5 10 15

Gln Leu Ala Leu Lys Leu Phe Glu Lys Ser Ala Glu Ile Tyr Gly Arg
20 25 30

Lys Ile Val Glu Phe Gln Ile Thr Lys Cys Lys Glu Lys Leu Ser Ala
35 40 45

His Pro Ser Val Asn Ser Ala His Leu Ser Val Asn Lys Glu Glu Lys
50 55 60

Val Asn Val Cys Asp Ser Pro Leu Asp Ile Ala Thr Gln Leu Leu Leu
65 70 75 80

Ser Asn Val Lys Lys Leu Val Leu Ser Asp Ser Glu Lys Asn Thr Leu
85 90 95

Lys Asn Lys Trp Lys Leu Leu Thr Glu Lys Lys Ser Glu Asn Ala Glu
100 105 110

Val Arg Ala Val Ala Leu Val Pro Lys Asp Phe Pro Lys Asp Leu Val
115 120 125

Leu Ala Pro Leu Pro Asp His Val Asn Asp Phe Thr Trp Tyr Lys Lys
130 135 140

Arg Lys Lys Arg Leu Gly Ile Lys Pro Glu His Gln His Val Gly Leu
145 150 155 160

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UNITED STATES PATENT AND TRADEMARK OFFICE
CERTIFICATE OF CORRECTION

Page 10 of 35

PATENT NO. : 7,223,571 B2
APPLICATION NO.: 10/642,248
ISSUE DATE : May 29, 2007
INVENTOR(S) : Paul DeAngelis and Wei Jing

It is certified that an error appears or errors appear in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

Ser Ile Ile Val Thr Thr Phe Asn Arg Pro Ala Ile Leu Ser Ile Thr
165 170 175
Leu Ala Cys Leu Val Asn Gln Lys Thr His Tyr Pro Phe Glu Val Ile
180 185 190
Val Thr Asp Asp Gly Ser Gln Glu Asp Leu Ser Pro Ile Ile Arg Gln
195 200 205
Tyr Glu Asn Lys Leu Asp Ile Arg Tyr Val Arg Gln Lys Asp Asn Gly
210 215 220
Phe Gln Ala Ser Ala Ala Arg Asn Met Gly Leu Arg Leu Ala Lys Tyr
225 230 235 240
Asp Phe Ile Gly Leu Leu Asp Cys Asp Met Ala Pro Asn Pro Leu Trp
245 250 255
Val His Ser Tyr Val Ala Glu Leu Leu Val Gln Lys Tyr Glu Gln Lys
260 265 270
Leu Asp Ile Lys Tyr Val Arg Gln Lys Asp Tyr Gly Tyr Gln Leu Cys
275 280 285
Ala Val Arg Asn Leu Gly Leu Arg Thr Ala Lys Tyr Asp Phe Val Ser
290 295 300
Ile Leu Asp Cys Asp Met Ala Pro Gln Gln Leu Trp Val His Ser Tyr
305 310 315 320

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Page 11 of 35

PATENT NO. : 7,223,571 B2

APPLICATION NO.: 10/642,248

ISSUE DATE : May 29, 2007

INVENTOR(S) : Paul DeAngelis and Wei Jing

It is certified that an error appears or errors appear in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

Leu Thr Glu Leu Leu Glu Asp Asn Asp Ile Val Leu Ile Gly Pro Arg
325 330 335

Lys Tyr Val Asp Thr His Asn Ile Thr Ala Glu Gln Phe Leu Asn Asp
340 345 350

Pro Tyr Leu Ile Glu Ser Leu Pro Glu Thr Ala Thr Asn Asn Asn Pro
355 360 365

Ser Ile Thr Ser Lys Gly Asn Ile Ser Leu Asp Trp Arg Leu Glu His
370 375 380

Phe Lys Lys Thr Asp Asn Leu Arg Leu Cys Asp Ser Pro Phe Arg Tyr
385 390 395 400

Phe Ser Cys Gly Asn Val Ala Phe Ser Lys Glu Trp Leu Asn Lys Val
405 410 415

Gly Trp Phe Asp Glu Glu Phe Asn His Trp Gly Gly Glu Asp Val Glu
420 425 430

Phe Gly Tyr Arg Leu Phe Ala Lys Gly Cys Phe Phe Arg Val Ile Asp
435 440 445

Gly Gly Met Ala Tyr His Gln Glu Pro Pro Gly Lys Glu Asn Glu Thr
450 455 460

Asp Arg Glu Ala Gly Lys Ser Ile Thr Leu Lys Ile Val Lys Glu Lys
465 470 475 480

Val Pro Tyr Ile Tyr Arg Lys Leu Leu Pro Ile Glu Asp Ser His Ile
485 490 495

His Arg Ile Pro Leu Val Ser Ile Tyr Ile Pro Ala Tyr Asn Cys Ala
500 505 510

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UNITED STATES PATENT AND TRADEMARK OFFICE
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Page 12 of 35

PATENT NO. : 7,223,571 B2
APPLICATION NO.: 10/642,248
ISSUE DATE : May 29, 2007
INVENTOR(S) : Paul DeAngelis and Wei Jing

It is certified that an error appears or errors appear in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

Asn Tyr Ile Gln Arg Cys Val Asp Ser Ala Leu Asn Gln Thr Val Val
515 520 525
Asp Leu Glu Val Cys Ile Cys Asn Asp Gly Ser Thr Asp Asn Thr Leu
530 535 540
Glu Val Ile Asn Lys Leu Tyr Gly Asn Asn Pro Arg Val Arg Ile Met
545 550 555 560
Ser Lys Pro Asn Gly Gly Ile Ala Ser Ala Ser Asn Ala Ala Val Ser
565 570 575
Phe Ala Lys Gly Tyr Tyr Ile Gly Gln Leu Asp Ser Asp Asp Tyr Leu
580 585 590
Glu Pro Asp Ala Val Glu Leu Cys Leu Lys Glu Phe Leu Lys Asp Lys
595 600 605
Thr Leu Ala Cys Val Tyr Thr Thr Asn Arg Asn Val Asn Pro Asp Gly
610 615 620
Ser Leu Ile Ala Asn Gly Tyr Asn Trp Pro Glu Phe Ser Arg Glu Lys
625 630 635 640
Leu Thr Thr Ala Met Ile Ala His His Phe Arg Met Phe Thr Ile Arg
645 650 655
Ala Trp His Leu Thr Asp Gly Phe Asn Glu Asn Ile Glu Asn Ala Val
660 665 670
Asp Tyr Asp Met Phe Leu Lys Leu Ser Glu Val Gly Lys Phe Lys His
675 680 685
Leu Asn Lys Ile Cys Tyr Asn Arg Val Leu His Gly Asp Asn Thr Ser
690 695 700

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PATENT NO. : 7,223,571 B2

APPLICATION NO.: 10/642,248

ISSUE DATE : May 29, 2007

INVENTOR(S) : Paul DeAngelis and Wei Jing

It is certified that an error appears or errors appear in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

Ile Lys Lys Leu Gly Ile Gln Lys Lys Asn His Phe Val Val Val Asn
705 710 715 720

Gln Ser Leu Asn Arg Gln Gly Ile Asn Tyr Tyr Asn Tyr Asp Lys Phe
725 730 735

Asp Asp Leu Asp Glu Ser Arg Lys Tyr Ile Phe Asn Lys Thr Ala Glu
740 745 750

Tyr Gln Glu Glu Met Asp Ile Leu Lys Asp Leu Lys Leu Ile Gln Asn
755 760 765

Lys Asp Ala
770

<210> 75
<211> 696
<212> PRT
<213> Pasteurella multocida
<400> 75

Met Asn Thr Leu Ser Gln Ala Ile Lys Ala Tyr Asn Ser Asn Asp Tyr
1 5 10 15

Glu Leu Ala Leu Lys Leu Phe Glu Lys Ser Ala Glu Thr Tyr Gly Arg
20 25 30

Lys Ile Val Glu Phe Gln Ile Ile Lys Cys Lys Glu Lys Leu Ser Thr
35 40 45

Asn Ser Tyr Val Ser Glu Asp Lys Lys Asn Ser Val Cys Asp Ser Ser
50 55 60

Leu Asp Ile Ala Thr Gln Leu Leu Leu Ser Asn Val Lys Lys Leu Thr
65 70 75 80

MAILING ADDRESS OF SENDER (Please do not use customer number below):

Kathryn L. Hester, Reg. # 46,768
Dunlap Coddling & Rogers, P.C.
P. O. Box 16370
Oklahoma City, OK 73113

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7336 7 2007

UNITED STATES PATENT AND TRADEMARK OFFICE
CERTIFICATE OF CORRECTION

Page 14 of 35

PATENT NO. : 7,223,571 B2

APPLICATION NO.: 10/642,248

ISSUE DATE : May 29, 2007

INVENTOR(S) : Paul DeAngelis and Wei Jing

It is certified that an error appears or errors appear in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

Leu Ser Glu Ser Glu Lys Asn Ser Leu Lys Asn Lys Trp Lys Ser Ile
85 90 95

Thr Gly Lys Lys Ser Glu Asn Ala Glu Ile Arg Lys Val Glu Leu Val
100 105 110

Pro Lys Asp Phe Pro Lys Asp Leu Val Leu Ala Pro Leu Pro Asp His
115 120 125

Val Asn Asp Phe Thr Trp Tyr Lys Asn Arg Lys Lys Ser Leu Gly Ile
130 135 140

Lys Pro Val Asn Lys Asn Ile Gly Leu Ser Ile Ile Ile Pro Thr Phe
145 150 155 160

Asn Arg Ser Arg Ile Leu Asp Ile Thr Leu Ala Cys Leu Val Asn Gln
165 170 175

Lys Thr Asn Tyr Pro Phe Glu Val Val Val Ala Asp Asp Gly Ser Lys
180 185 190

Glu Asn Leu Leu Thr Ile Ile Arg Gln Tyr Glu Asn Lys Leu Asp Ile
195 200 205

Arg Tyr Val Arg Gln Lys Asp Asn Gly Phe Gln Ala Ser Ala Ala Arg
210 215 220

Asn Met Gly Leu Arg Leu Ala Lys Tyr Asp Phe Ile Gly Leu Leu Asp
225 230 235 240

Cys Asp Met Ala Pro Asn Pro Leu Trp Val His Ser Tyr Val Ala Glu
245 250 255

Leu Leu Glu Asp Asp Asp Leu Thr Ile Ile Gly Pro Arg Lys Tyr Ile
260 265 270

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AUG 7 2007

UNITED STATES PATENT AND TRADEMARK OFFICE
CERTIFICATE OF CORRECTION

Page 15 of 35

PATENT NO. : 7,223,571 B2
APPLICATION NO.: 10/642,248
ISSUE DATE : May 29, 2007
INVENTOR(S) : Paul DeAngelis and Wei Jing

It is certified that an error appears or errors appear in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

Asp Thr Gln His Ile Asp Pro Lys Asp Phe Leu Asn Asn Ala Ser Leu
275 280 285

Leu Glu Ser Leu Pro Glu Val Lys Thr Asn Asn Ser Val Ala Ala Lys
290 295 300

Gly Glu Gly Thr Val Ser Leu Asp Trp Arg Leu Glu Gln Phe Glu Lys
305 310 315 320

Thr Glu Asn Leu Arg Leu Ser Asp Ser Pro Phe Arg Phe Phe Ala Ala
325 330 335

Gly Asn Val Ala Phe Ala Lys Lys Trp Leu Asn Lys Ser Gly Phe Phe
340 345 350

Asp Glu Glu Phe Asn His Trp Gly Gly Glu Asp Val Glu Phe Gly Tyr
355 360 365

Arg Leu Phe Arg Tyr Gly Ser Phe Phe Lys Thr Ile Asp Gly Ile Met
370 375 380

Ala Tyr His Gln Glu Pro Pro Gly Lys Glu Asn Glu Thr Asp Arg Glu
385 390 395 400

Ala Gly Lys Asn Ile Thr Leu Asp Ile Met Arg Glu Lys Val Pro Tyr
405 410 415

Ile Tyr Arg Lys Leu Leu Pro Ile Glu Asp Ser His Ile Asn Arg Val
420 425 430

Pro Leu Val Ser Ile Tyr Ile Pro Ala Tyr Asn Cys Ala Asn Tyr Ile
435 440 445

Gln Arg Cys Val Asp Ser Ala Leu Asn Gln Thr Val Val Asp Leu Glu
450 455 460

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Page 16 of 35

PATENT NO. : 7,223,571 B2
APPLICATION NO.: 10/642,248
ISSUE DATE : May 29, 2007
INVENTOR(S) : Paul DeAngelis and Wei Jing

It is certified that an error appears or errors appear in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

Val Cys Ile Cys Asn Asp Gly Ser Thr Asp Asn Thr Leu Glu Val Ile
465 470 475 480
Asn Lys Leu Tyr Gly Asn Asn Pro Arg Val Arg Ile Met Ser Lys Pro
485 490 495
Asn Gly Gly Ile Ala Ser Ala Ser Asn Ala Ala Val Ser Phe Ala Lys
500 505 510
Gly Tyr Tyr Ile Gly Gln Leu Asp Ser Asp Asp Tyr Leu Glu Pro Asp
515 520 525
Ala Val Glu Leu Cys Leu Lys Glu Phe Leu Lys Asp Lys Thr Leu Ala
530 535 540
Cys Val Tyr Thr Thr Asn Arg Asn Val Asn Pro Asp Gly Ser Leu Ile
545 550 555 560
Ala Asn Gly Tyr Asn Trp Pro Glu Phe Ser Arg Glu Lys Leu Thr Thr
565 570 575
Ala Met Ile Ala His His Phe Arg Met Phe Thr Ile Arg Ala Trp His
580 585 590
Leu Thr Asp Gly Phe Asn Glu Lys Ile Glu Asn Ala Val Asp Tyr Asp
595 600 605
Met Phe Leu Lys Leu Ser Glu Val Gly Lys Phe Lys His Leu Asn Lys
610 615 620
Ile Cys Tyr Asn Arg Val Leu His Gly Asp Asn Thr Ser Ile Lys Lys
625 630 635 640
Leu Gly Ile Gln Lys Lys Asn His Phe Val Val Val Asn Gln Ser Leu
645 650 655

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Page 17 of 35

PATENT NO. : 7,223,571 B2
APPLICATION NO.: 10/642,248
ISSUE DATE : May 29, 2007
INVENTOR(S) : Paul DeAngelis and Wei Jing

It is certified that an error appears or errors appear in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

Asn Arg Gln Gly Ile Thr Tyr Tyr Asn Tyr Asp Glu Phe Asp Asp Leu
660 665 670

Asp Glu Ser Arg Lys Tyr Ile Phe Asn Lys Thr Ala Glu Tyr Gln Glu
675 680 685

Glu Ile Asp Ile Leu Lys Asp Ile
690 695

<210> 76
<211> 711
<212> PRT
<213> Pasteurella multocida

<400> 76

Met Asn Thr Leu Ser Gln Ala Ile Lys Ala Tyr Asn Ser Asn Asp Tyr
1 5 10 15

Gln Leu Ala Leu Lys Leu Phe Glu Lys Ser Ala Glu Ile Tyr Gly Arg
20 25 30

Lys Ile Val Glu Phe Gln Ile Thr Lys Cys Lys Glu Lys Leu Ser Ala
35 40 45

His Pro Ser Val Asn Ser Ala His Leu Ser Val Asn Lys Glu Glu Lys
50 55 60

Val Asn Val Cys Asp Ser Pro Leu Asp Ile Ala Thr Gln Leu Leu Leu
65 70 75 80

Ser Asn Val Lys Lys Leu Val Leu Ser Asp Ser Glu Lys Asn Thr Leu
85 90 95

Lys Asn Lys Trp Lys Leu Leu Thr Glu Lys Lys Ser Glu Asn Ala Glu
100 105 110

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UNITED STATES PATENT AND TRADEMARK OFFICE
CERTIFICATE OF CORRECTION

Page 18 of 35

PATENT NO. : 7,223,571 B2

APPLICATION NO.: 10/642,248

ISSUE DATE : May 29, 2007

INVENTOR(S) : Paul DeAngelis and Wei Jing

It is certified that an error appears or errors appear in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

Val Arg Ala Val Ala Leu Val Pro Lys Asp Phe Pro Lys Asp Leu Val
115 120 125

Leu Ala Pro Leu Pro Asp His Val Asn Asp Phe Thr Trp Tyr Lys Lys
130 135 140

Arg Lys Lys Arg Leu Gly Ile Lys Pro Glu His Gln His Val Gly Leu
145 150 155 160

Ser Ile Ile Val Thr Thr Phe Asn Arg Pro Ala Ile Leu Ser Ile Thr
165 170 175

Leu Ala Cys Leu Val Asn Gln Lys Thr His Tyr Pro Phe Glu Val Ile
180 185 190

Val Thr Asp Asp Gly Ser Gln Glu Asp Leu Ser Pro Ile Ile Arg Gln
195 200 205

Tyr Glu Asn Lys Leu Asp Ile Arg Tyr Val Arg Gln Lys Asp Tyr Gly
210 215 220

Tyr Gln Leu Cys Ala Val Arg Asn Leu Gly Leu Arg Thr Ala Lys Tyr
225 230 235 240

Asp Phe Val Ser Ile Leu Asp Cys Asp Met Ala Pro Gln Gln Leu Trp
245 250 255

Val His Ser Tyr Leu Thr Glu Leu Leu Glu Asp Asn Asp Ile Val Leu
260 265 270

Ile Gly Pro Arg Lys Tyr Val Asp Thr His Asn Ile Thr Ala Glu Gln
275 280 285

Phe Leu Asn Asp Pro Tyr Leu Ile Glu Ser Leu Pro Glu Thr Ala Thr
290 295 300

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UNITED STATES PATENT AND TRADEMARK OFFICE
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Page 19 of 35

PATENT NO. : 7,223,571 B2

APPLICATION NO.: 10/642,248

ISSUE DATE : May 29, 2007

INVENTOR(S) : Paul DeAngelis and Wei Jing

It is certified that an error appears or errors appear in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

Asn Asn Asn Pro Ser Ile Thr Ser Lys Gly Asn Ile Ser Leu Asp Trp
305 310 315 320

Arg Leu Glu His Phe Lys Lys Thr Asp Asn Leu Arg Leu Cys Asp Ser
325 330 335

Pro Phe Arg Tyr Phe Ser Cys Gly Asn Val Ala Phe Ser Lys Glu Trp
340 345 350

Leu Asn Lys Val Gly Trp Phe Asp Glu Glu Phe Asn His Trp Gly Gly
355 360 365

Glu Asp Val Glu Phe Gly Tyr Arg Leu Phe Ala Lys Gly Cys Phe Phe
370 375 380

Arg Val Ile Asp Gly Gly Met Ala Tyr His Gln Glu Pro Pro Gly Lys
385 390 395 400

Glu Asn Glu Thr Asp Arg Glu Ala Gly Lys Ser Ile Thr Leu Lys Ile
405 410 415

Val Lys Glu Lys Val Pro Tyr Ile Tyr Arg Lys Leu Leu Pro Ile Glu
420 425 430

Asp Ser His Ile His Arg Ile Pro Leu Val Ser Ile Tyr Ile Pro Ala
435 440 445

Tyr Asn Cys Ala Asn Tyr Ile Gln Arg Cys Val Asp Ser Ala Leu Asn
450 455 460

Gln Thr Val Val Asp Leu Glu Val Cys Ile Cys Asn Asp Gly Ser Thr
465 470 475 480

Asp Asn Thr Leu Glu Val Ile Asn Lys Leu Tyr Gly Asn Asn Pro Arg
485 490 495

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AUG 7 2007

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Page 20 of 35

PATENT NO. : 7,223,571 B2

APPLICATION NO.: 10/642,248

ISSUE DATE : May 29, 2007

INVENTOR(S) : Paul DeAngelis and Wei Jing

It is certified that an error appears or errors appear in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

Val Arg Ile Met Ser Lys Pro Asn Gly Gly Ile Ala Ser Ala Ser Asn
500 505 510

Ala Ala Val Ser Phe Ala Lys Gly Tyr Tyr Ile Gly Gln Leu Asp Ser
515 520 525

Asp Asp Tyr Leu Glu Pro Asp Ala Val Glu Leu Cys Leu Lys Glu Phe
530 535 540

Leu Lys Asp Lys Thr Leu Ala Cys Val Tyr Thr Thr Asn Arg Asn Val
545 550 555 560

Asn Pro Asp Gly Ser Leu Ile Ala Asn Gly Tyr Asn Trp Pro Glu Phe
565 570 575

Ser Arg Glu Lys Leu Thr Thr Ala Met Ile Ala His His Phe Arg Met
580 585 590

Phe Thr Ile Arg Ala Trp His Leu Thr Asp Gly Phe Asn Glu Asn Ile
595 600 605

Glu Asn Ala Val Asp Tyr Asp Met Phe Leu Lys Leu Ser Glu Val Gly
610 615 620

Lys Phe Lys His Leu Asn Lys Ile Cys Tyr Asn Arg Val Leu His Gly
625 630 635 640

Asp Asn Thr Ser Ile Lys Lys Leu Gly Ile Gln Lys Lys Asn His Phe
645 650 655

Val Val Val Asn Gln Ser Leu Asn Arg Gln Gly Ile Asn Tyr Tyr Asn
660 665 670

Tyr Asp Lys Phe Asp Asp Leu Asp Glu Ser Arg Lys Tyr Ile Phe Asn
675 680 685

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PATENT NO. : 7,223,571 B2

APPLICATION NO.: 10/642,248

ISSUE DATE : May 29, 2007

INVENTOR(S) : Paul DeAngelis and Wei Jing

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Lys Thr Ala Glu Tyr Gln Glu Glu Met Asp Ile Leu Lys Asp Leu Lys
690 695 700

Leu Ile Gln Asn Lys Asp Ala
705 710

<210> 77
<211> 696
<212> PRT
<213> Pasteurella multocida

<400> 77

Met Asn Thr Leu Ser Gln Ala Ile Lys Ala Tyr Asn Ser Asn Asp Tyr
1 5 10 15

Glu Leu Ala Leu Lys Leu Phe Glu Lys Ser Ala Glu Thr Tyr Gly Arg
20 25 30

Lys Ile Val Glu Phe Gln Ile Ile Lys Cys Lys Glu Lys Leu Ser Thr
35 40 45

Asn Ser Tyr Val Ser Glu Asp Lys Lys Asn Ser Val Cys Asp Ser Ser
50 55 60

Leu Asp Ile Ala Thr Gln Leu Leu Leu Ser Asn Val Lys Lys Leu Thr
65 70 75 80

Leu Ser Glu Ser Glu Lys Asn Ser Leu Lys Asn Lys Trp Lys Ser Ile
85 90 95

Thr Gly Lys Lys Ser Glu Asn Ala Glu Ile Arg Lys Val Glu Leu Val
100 105 110

Pro Lys Asp Phe Pro Lys Asp Leu Val Leu Ala Pro Leu Pro Asp His
115 120 125

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UNITED STATES PATENT AND TRADEMARK OFFICE
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Page 22 of 35

PATENT NO. : 7,223,571 B2
APPLICATION NO.: 10/642,248
ISSUE DATE : May 29, 2007
INVENTOR(S) : Paul DeAngelis and Wei Jing

It is certified that an error appears or errors appear in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

Val Asn Asp Phe Thr Trp Tyr Lys Asn Arg Lys Lys Ser Leu Gly Ile
130 135 140
Lys Pro Val Asn Lys Asn Ile Gly Leu Ser Ile Ile Ile Pro Thr Phe
145 150 155 160
Asn Arg Ser Arg Ile Leu Asp Ile Thr Leu Ala Cys Leu Val Asn Gln
165 170 175
Lys Thr Asn Tyr Pro Phe Glu Val Val Val Ala Asp Asp Gly Ser Lys
180 185 190
Glu Asn Leu Leu Thr Ile Val Gln Lys Tyr Glu Gln Lys Leu Asp Ile
195 200 205
Lys Tyr Val Arg Gln Lys Asp Asn Gly Phe Gln Ala Ser Ala Ala Arg
210 215 220
Asn Met Gly Leu Arg Leu Ala Lys Tyr Asp Phe Ile Gly Leu Leu Asp
225 230 235 240
Cys Asp Met Ala Pro Asn Pro Leu Trp Val His Ser Tyr Val Ala Glu
245 250 255
Leu Leu Glu Asp Asp Leu Thr Ile Ile Gly Pro Arg Lys Tyr Ile
260 265 270
Asp Thr Gln His Ile Asp Pro Lys Asp Phe Leu Asn Asn Ala Ser Leu
275 280 285
Leu Glu Ser Leu Pro Glu Val Lys Thr Asn Asn Ser Val Ala Ala Lys
290 295 300
Gly Glu Gly Thr Val Ser Leu Asp Trp Arg Leu Glu Gln Phe Glu Lys
305 310 315 320

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PATENT NO. : 7,223,571 B2

APPLICATION NO.: 10/642,248

ISSUE DATE : May 29, 2007

INVENTOR(S) : Paul DeAngelis and Wei Jing

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Thr Glu Asn Leu Arg Leu Ser Asp Ser Pro Phe Arg Phe Phe Ala Ala
325 330 335
Gly Asn Val Ala Phe Ala Lys Lys Trp Leu Asn Lys Ser Gly Phe Phe
340 345 350
Asp Glu Glu Phe Asn His Trp Gly Gly Glu Asp Val Glu Phe Gly Tyr
355 360 365
Arg Leu Phe Arg Tyr Gly Ser Phe Phe Lys Thr Ile Asp Gly Ile Met
370 375 380
Ala Tyr His Gln Glu Pro Pro Gly Lys Glu Asn Glu Thr Asp Arg Glu
385 390 395 400
Ala Gly Lys Asn Ile Thr Leu Asp Ile Met Arg Glu Lys Val Pro Tyr
405 410 415
Ile Tyr Arg Lys Leu Leu Pro Ile Glu Asp Ser His Ile Asn Arg Val
420 425 430
Pro Leu Val Ser Ile Tyr Ile Pro Ala Tyr Asn Cys Ala Asn Tyr Ile
435 440 445
Gln Arg Cys Val Asp Ser Ala Leu Asn Gln Thr Val Val Asp Leu Glu
450 455 460
Val Cys Ile Cys Asn Asp Gly Ser Thr Asp Asn Thr Leu Glu Val Ile
465 470 475 480
Asn Lys Leu Tyr Gly Asn Asn Pro Arg Val Arg Ile Met Ser Lys Pro
485 490 495
Asn Gly Gly Ile Ala Ser Ala Ser Asn Ala Ala Val Ser Phe Ala Lys
500 505 510

MAILING ADDRESS OF SENDER (Please do not use customer number below):

Kathryn L. Hester, Reg. # 46,768
Dunlap Coddling & Rogers, P.C.
P. O. Box 16370
Oklahoma City, OK 73113

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AUG 7 2007

UNITED STATES PATENT AND TRADEMARK OFFICE
CERTIFICATE OF CORRECTION

Page 24 of 35

PATENT NO. : 7,223,571 B2
APPLICATION NO.: 10/642,248
ISSUE DATE : May 29, 2007
INVENTOR(S) : Paul DeAngelis and Wei Jing

It is certified that an error appears or errors appear in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

Gly Tyr Tyr Ile Gly Gln Leu Asp Ser Asp Asp Tyr Leu Glu Pro Asp
515 520 525

Ala Val Glu Leu Cys Leu Lys Glu Phe Leu Lys Asp Lys Thr Leu Ala
530 535 540

Cys Val Tyr Thr Thr Asn Arg Asn Val Asn Pro Asp Gly Ser Leu Ile
545 550 555 560

Ala Asn Gly Tyr Asn Trp Pro Glu Phe Ser Arg Glu Lys Leu Thr Thr
565 570 575

Ala Met Ile Ala His His Phe Arg Met Phe Thr Ile Arg Ala Trp His
580 585 590

Leu Thr Asp Gly Phe Asn Glu Lys Ile Glu Asn Ala Val Asp Tyr Asp
595 600 605

Met Phe Leu Lys Leu Ser Glu Val Gly Lys Phe Lys His Leu Asn Lys
610 615 620

Ile Cys Tyr Asn Arg Val Leu His Gly Asp Asn Thr Ser Ile Lys Lys
625 630 635 640

Leu Gly Ile Gln Lys Lys Asn His Phe Val Val Val Asn Gln Ser Leu
645 650 655

Asn Arg Gln Gly Ile Thr Tyr Tyr Asn Tyr Asp Glu Phe Asp Asp Leu
660 665 670

Asp Glu Ser Arg Lys Tyr Ile Phe Asn Lys Thr Ala Glu Tyr Gln Glu
675 680 685

Glu Ile Asp Ile Leu Lys Asp Ile
690 695

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Page 25 of 35

PATENT NO. : 7,223,571 B2
APPLICATION NO.: 10/642,248
ISSUE DATE : May 29, 2007
INVENTOR(S) : Paul DeAngelis and Wei Jing

It is certified that an error appears or errors appear in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

<210> 78
<211> 40
<212> PRT
<213> Pasteurella multocida

<400> 78

Asn Lys Leu Asp Ile Arg Tyr Val Arg Gln Lys Asp Asn Gly Phe Gln
1 5 10 15

Ala Ser Ala Ala Arg Asn Met Gly Leu Arg Leu Ala Lys Tyr Asp Phe
20 25 30

Ile Gly Leu Leu Asp Cys Asp Met
35 40

<210> 79
<211> 40
<212> PRT
<213> Pasteurella multocida

<400> 79

Gln Lys Leu Asp Ile Lys Tyr Val Arg Gln Lys Asp Tyr Gly Tyr Gln
1 5 10 15

Leu Cys Ala Val Arg Asn Leu Gly Leu Arg Thr Ala Lys Tyr Asp Phe
20 25 30

Val Ser Ile Leu Asp Cys Asp Met
35 40

<210> 80
<211> 40
<212> PRT
<213> Meleagris gallopavo

<400> 80

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Page 26 of 35

PATENT NO. : 7,223,571 B2

APPLICATION NO.: 10/642,248

ISSUE DATE : May 29, 2007

INVENTOR(S) : Paul DeAngelis and Wei Jing

It is certified that an error appears or errors appear in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

Glu Lys Leu Asp Ile Lys Tyr Val Arg Gln Lys Asp Tyr Gly Tyr Gln
1 5 10 15

Leu Cys Ala Val Arg Asn Leu Gly Leu Arg Thr Ala Lys Tyr Asp Phe
20 25 30

Val Ser Ile Leu Asp Cys Asp Met
35 40

<210> 81
<211> 36
<212> PRT
<213> Goose

<400> 81

Val Asp Ile Lys Tyr Val Arg Gln Lys Asp Tyr Gly Tyr Gln Leu Cys
1 5 10 15

Ala Val Arg Asn Leu Gly Leu Arg Thr Ala Lys Tyr Asp Phe Val Ser
20 25 30

Ile Leu Asp Cys
35

<210> 82
<211> 33
<212> PRT
<213> sea lion

<400> 82

Lys Tyr Val Arg Gln Lys Asp Tyr Gly Tyr Gln Leu Cys Ala Val Arg
1 5 10 15

Asn Leu Gly Leu Arg Thr Ala Lys Tyr Asp Phe Val Ser Ile Leu Asp
20 25 30

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PATENT NO. : 7,223,571 B2
APPLICATION NO.: 10/642,248
ISSUE DATE : May 29, 2007
INVENTOR(S) : Paul DeAngelis and Wei Jing

It is certified that an error appears or errors appear in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

Cys

<210> 83
<211> 35
<212> PRT
<213> Artificial sequence

<220>
<223> Consensus of SEQ ID NOS:78-82

<220>
<221> misc_feature
<222> (12)..(12)
<223> Xaa can be any naturally occurring amino acid

<220>
<221> misc_feature
<222> (20)..(20)
<223> Xaa can be any naturally occurring amino acid

<220>
<221> misc_feature
<222> (30)..(30)
<223> Xaa can be any naturally occurring amino acid

<400> 83

Asp Ile Lys Tyr Val Arg Gln Lys Asp Tyr Gly Xaa Gln Leu Cys Ala
1 5 10 15

Val Arg Asn Xaa Gly Leu Arg Thr Ala Lys Tyr Asp Phe Xaa Ser Ile
20 25 30

Leu Asp Cys
35

<210> 84
<211> 703
<212> PRT
<213> Pasteurella multocida

MAILING ADDRESS OF SENDER (Please do not use customer number below):

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PATENT NO. : 7,223,571 B2
APPLICATION NO.: 10/642,248
ISSUE DATE : May 29, 2007
INVENTOR(S) : Paul DeAngelis and Wei Jing

It is certified that an error appears or errors appear in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

<400> 84
Met Asn Thr Leu Ser Gln Ala Ile Lys Ala Tyr Asn Ser Asn Asp Tyr
1 5 10 15
Gln Leu Ala Leu Lys Leu Phe Glu Lys Ser Ala Glu Ile Tyr Gly Arg
20 25 30
Lys Ile Val Glu Phe Gln Ile Thr Lys Cys Lys Glu Lys Leu Ser Ala
35 40 45
His Pro Ser Val Asn Ser Ala His Leu Ser Val Asn Lys Glu Glu Lys
50 55 60
Val Asn Val Cys Asp Ser Pro Leu Asp Ile Ala Thr Gln Leu Leu Leu
65 70 75 80
Ser Asn Val Lys Lys Leu Val Leu Ser Asp Ser Glu Lys Asn Thr Leu
85 90 95
Lys Asn Lys Trp Lys Leu Leu Thr Glu Lys Lys Ser Glu Asn Ala Glu
100 105 110
Val Arg Ala Val Ala Leu Val Pro Lys Asp Phe Pro Lys Asp Leu Val
115 120 125
Leu Ala Pro Leu Pro Asp His Val Asn Asp Phe Thr Trp Tyr Lys Lys
130 135 140
Arg Lys Lys Arg Leu Gly Ile Lys Pro Glu His Gln His Val Gly Leu
145 150 155 160
Ser Ile Ile Val Thr Phe Asn Arg Pro Ala Ile Leu Ser Ile Thr
165 170 175

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Page 29 of 35

PATENT NO. : 7,223,571 B2

APPLICATION NO.: 10/642,248

ISSUE DATE : May 29, 2007

INVENTOR(S) : Paul DeAngelis and Wei Jing

It is certified that an error appears or errors appear in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

Leu Ala Cys Leu Val Asn Gln Lys Thr His Tyr Pro Phe Glu Val Ile
180 185 190

Val Thr Asp Asp Gly Ser Gln Glu Asp Leu Ser Pro Ile Ile Arg Gln
195 200 205

Tyr Glu Asn Lys Leu Asp Ile Arg Tyr Val Arg Gln Lys Asp Tyr Gly
210 215 220

Tyr Gln Leu Cys Ala Val Arg Asn Leu Gly Leu Arg Thr Ala Lys Tyr
225 230 235 240

Asp Phe Val Ser Ile Leu Asp Cys Asp Met Ala Pro Gln Gln Leu Trp
245 250 255

Val His Ser Tyr Leu Thr Glu Leu Leu Glu Asp Asp Asp Leu Thr Ile
260 265 270

Ile Gly Pro Arg Lys Tyr Ile Asp Thr Gln His Ile Asp Pro Lys Asp
275 280 285

Phe Leu Asn Asn Ala Ser Leu Leu Glu Ser Leu Pro Glu Val Lys Thr
290 295 300

Asn Asn Ser Val Ala Ala Lys Gly Glu Gly Thr Val Ser Leu Asp Trp
305 310 315 320

Arg Leu Glu Gln Phe Glu Lys Thr Glu Asn Leu Arg Leu Ser Asp Ser
325 330 335

Pro Phe Arg Phe Phe Ala Ala Gly Asn Val Ala Phe Ala Lys Lys Trp
340 345 350

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Page 30 of 35

PATENT NO. : 7,223,571 B2

APPLICATION NO.: 10/642,248

ISSUE DATE : May 29, 2007

INVENTOR(S) : Paul DeAngelis and Wei Jing

It is certified that an error appears or errors appear in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

Leu Asn Lys Ser Gly Phe Phe Asp Glu Glu Phe Asn His Trp Gly Gly
355 360 365

Glu Asp Val Glu Phe Gly Tyr Arg Leu Phe Arg Tyr Gly Ser Phe Phe
370 375 380

Lys Thr Ile Asp Gly Ile Met Ala Tyr His Gln Glu Pro Pro Gly Lys
385 390 395 400

Glu Asn Glu Thr Asp Arg Glu Ala Gly Lys Asn Ile Thr Leu Asp Ile
405 410 415

Met Arg Glu Lys Val Pro Tyr Ile Tyr Arg Lys Leu Leu Pro Ile Glu
420 425 430

Asp Ser His Ile Asn Arg Val Pro Leu Val Ser Ile Tyr Ile Pro Ala
435 440 445

Tyr Asn Cys Ala Asn Tyr Ile Gln Arg Cys Val Asp Ser Ala Leu Asn
450 455 460

Gln Thr Val Val Asp Leu Glu Val Cys Ile Cys Asn Asp Gly Ser Thr
465 470 475 480

Asp Asn Thr Leu Glu Val Ile Asn Lys Leu Tyr Gly Asn Asn Pro Arg
485 490 495

Val Arg Ile Met Ser Lys Pro Asn Gly Gly Ile Ala Ser Ala Ser Asn
500 505 510

Ala Ala Val Ser Phe Ala Lys Gly Tyr Tyr Ile Gly Gln Leu Asp Ser
515 520 525

Asp Asp Tyr Leu Glu Pro Asp Ala Val Glu Leu Cys Leu Lys Glu Phe
530 535 540

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Page 31 of 35

PATENT NO. : 7,223,571 B2
APPLICATION NO.: 10/642,248
ISSUE DATE : May 29, 2007
INVENTOR(S) : Paul DeAngelis and Wei Jing

It is certified that an error appears or errors appear in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

Leu Lys Asp Lys Thr Leu Ala Cys Val Tyr Thr Thr Asn Arg Asn Val
545 550 555 560

Asn Pro Asp Gly Ser Leu Ile Ala Asn Gly Tyr Asn Trp Pro Glu Phe
565 570 575

Ser Arg Glu Lys Leu Thr Thr Ala Met Ile Ala His His Phe Arg Met
580 585 590

Phe Thr Ile Arg Ala Trp His Leu Thr Asp Gly Phe Asn Glu Lys Ile
595 600 605

Glu Asn Ala Val Asp Tyr Asp Met Phe Leu Lys Leu Ser Glu Val Gly
610 615 620

Lys Phe Lys His Leu Asn Lys Ile Cys Tyr Asn Arg Val Leu His Gly
625 630 635 640

Asp Asn Thr Ser Ile Lys Lys Leu Gly Ile Gln Lys Lys Asn His Phe
645 650 655

Val Val Val Asn Gln Ser Leu Asn Arg Gln Gly Ile Thr Tyr Tyr Asn
660 665 670

Tyr Asp Glu Phe Asp Asp Leu Asp Glu Ser Arg Lys Tyr Ile Phe Asn
675 680 685

Lys Thr Ala Glu Tyr Gln Glu Glu Ile Asp Ile Leu Lys Asp Ile
690 695 700

<210> 85
<211> 705
<212> PRT
<213> Pasteurella multocida
<400> 85

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Page 32 of 35

PATENT NO. : 7,223,571 B2
APPLICATION NO.: 10/642,248
ISSUE DATE : May 29, 2007
INVENTOR(S) : Paul DeAngelis and Wei Jing

It is certified that an error appears or errors appear in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

Met Asn Thr Leu Ser Gln Ala Ile Lys Ala Tyr Asn Ser Asn Asp Tyr
1 5 10 15
Glu Leu Ala Leu Lys Leu Phe Glu Lys Ser Ala Glu Thr Tyr Gly Arg
20 25 30
Lys Ile Val Glu Phe Gln Ile Ile Lys Cys Lys Glu Lys Leu Ser Thr
35 40 45
Asn Ser Tyr Val Ser Glu Asp Lys Lys Asn Ser Val Cys Asp Ser Ser
50 55 60
Leu Asp Ile Ala Thr Gln Leu Leu Leu Ser Asn Val Lys Lys Leu Thr
65 70 75 80
Leu Ser Glu Ser Glu Lys Asn Ser Leu Lys Asn Lys Trp Lys Ser Ile
85 90 95
Thr Gly Lys Lys Ser Glu Asn Ala Glu Ile Arg Lys Val Glu Leu Val
100 105 110
Pro Lys Asp Phe Pro Lys Asp Leu Val Leu Ala Pro Leu Pro Asp His
115 120 125
Val Asn Asp Phe Thr Trp Tyr Lys Asn Arg Lys Lys Ser Leu Gly Ile
130 135 140
Lys Pro Val Asn Lys Asn Ile Gly Leu Ser Ile Ile Ile Pro Thr Phe
145 150 155 160
Asn Arg Ser Arg Ile Leu Asp Ile Thr Leu Ala Cys Leu Val Asn Gln
165 170 175
Lys Thr Asn Tyr Pro Phe Glu Val Val Val Ala Asp Asp Gly Ser Lys
180 185 190

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PATENT NO. : 7,223,571 B2
APPLICATION NO.: 10/642,248
ISSUE DATE : May 29, 2007
INVENTOR(S) : Paul DeAngelis and Wei Jing

It is certified that an error appears or errors appear in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

Glu Asn Leu Leu Thr Ile Val Gln Lys Tyr Glu Gln Lys Leu Asp Ile
195 200 205
Lys Tyr Val Arg Gln Lys Asp Asn Gly Phe Gln Ala Ser Ala Ala Arg
210 215 220
Asn Met Gly Leu Arg Leu Ala Lys Tyr Asp Phe Ile Gly Leu Leu Asp
225 230 235 240
Cys Asp Met Ala Pro Asn Pro Leu Trp Val His Ser Tyr Val Ala Glu
245 250 255
Leu Leu Leu Glu Asp Asn Asp Ile Val Leu Ile Gly Pro Arg Lys Tyr
260 265 270
Val Asp Thr His Asn Ile Thr Ala Glu Gln Phe Leu Asn Asp Pro Tyr
275 280 285
Leu Ile Glu Ser Leu Pro Glu Thr Ala Thr Asn Asn Asn Pro Ser Ile
290 295 300
Thr Ser Lys Gly Asn Ile Ser Leu Asp Trp Arg Leu Glu His Phe Lys
305 310 315 320
Lys Thr Asp Asn Leu Arg Leu Cys Asp Ser Pro Phe Arg Tyr Phe Ser
325 330 335
Cys Gly Asn Val Ala Phe Ser Lys Glu Trp Leu Asn Lys Val Gly Trp
340 345 350
Phe Asp Glu Glu Phe Asn His Trp Gly Gly Glu Asp Val Glu Phe Gly
355 360 365
Tyr Arg Leu Phe Ala Lys Gly Cys Phe Phe Arg Val Ile Asp Gly Gly
370 375 380

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PATENT NO. : 7,223,571 B2

APPLICATION NO.: 10/642,248

ISSUE DATE : May 29, 2007

INVENTOR(S) : Paul DeAngelis and Wei Jing

It is certified that an error appears or errors appear in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

Met Ala Tyr His Gln Glu Pro Pro Gly Lys Glu Asn Glu Thr Asp Arg
385 390 395 400

Glu Ala Gly Lys Ser Ile Thr Leu Lys Ile Val Lys Glu Lys Val Pro
405 410 415

Tyr Ile Tyr Arg Lys Leu Leu Pro Ile Glu Asp Ser His Ile His Arg
420 425 430

Ile Pro Leu Val Ser Ile Tyr Ile Pro Ala Tyr Asn Cys Ala Asn Tyr
435 440 445

Ile Gln Arg Cys Val Asp Ser Ala Leu Asn Gln Thr Val Val Asp Leu
450 455 460

Glu Val Cys Ile Cys Asn Asp Gly Ser Thr Asp Asn Thr Leu Glu Val
465 470 475 480

Ile Asn Lys Leu Tyr Gly Asn Asn Pro Arg Val Arg Ile Met Ser Lys
485 490 495

Pro Asn Gly Gly Ile Ala Ser Ala Ser Asn Ala Ala Val Ser Phe Ala
500 505 510

Lys Gly Tyr Tyr Ile Gly Gln Leu Asp Ser Asp Asp Tyr Leu Glu Pro
515 520 525

Asp Ala Val Glu Leu Cys Leu Lys Glu Phe Leu Lys Asp Lys Thr Leu
530 535 540

Ala Cys Val Tyr Thr Thr Asn Arg Asn Val Asn Pro Asp Gly Ser Leu
545 550 555 560

Ile Ala Asn Gly Tyr Asn Trp Pro Glu Phe Ser Arg Glu Lys Leu Thr
565 570 575

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UNITED STATES PATENT AND TRADEMARK OFFICE
CERTIFICATE OF CORRECTION

Page 35 of 35

PATENT NO. : 7,223,571 B2

APPLICATION NO.: 10/642,248

ISSUE DATE : May 29, 2007

INVENTOR(S) : Paul DeAngelis and Wei Jing

It is certified that an error appears or errors appear in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

Thr Ala Met Ile Ala His His Phe Arg Met Phe Thr Ile Arg Ala Trp
580 585 590

His Leu Thr Asp Gly Phe Asn Glu Asn Ile Glu Asn Ala Val Asp Tyr
595 600 605

Asp Met Phe Leu Lys Leu Ser Glu Val Gly Lys Phe Lys His Leu Asn
610 615 620

Lys Ile Cys Tyr Asn Arg Val Leu His Gly Asp Asn Thr Ser Ile Lys
625 630 635 640

Lys Leu Gly Ile Gln Lys Lys Asn His Phe Val Val Val Asn Gln Ser
645 650 655

Leu Asn Arg Gln Gly Ile Asn Tyr Tyr Asn Tyr Asp Lys Phe Asp Asp
660 665 670

Leu Asp Glu Ser Arg Lys Tyr Ile Phe Asn Lys Thr Ala Glu Tyr Gln
675 680 685

Glu Glu Met Asp Ile Leu Lys Asp Leu Lys Leu Ile Gln Asn Lys Asp
690 695 700

Ala
705

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